to be bulged up, so as to form a mound on the foreshore, which is being rapidly destroyed by the sea; while further east, opposite the end of Wellington Terrace, the overlying more sandy clays are also seen bulged up. Along the main road also, in front of West Lawn, on the western side of the supposed fault, the surface has been squeezed up. On the eastern side of this fault, further cracks, indicating a forward motion, are seen at the entrance to Encombe grounds; and, finally, the Coast Guard houses and the wall in front bulge forward at least three feet, and probably more, and the two sides of the street opposite have been squeezed together.

Thus the whole disturbance has been caused by the slipping downwards of the overlying soft beds over the inclined plane formed by the basement band of clay which rests on the Hythe limestone as a firm foundation, the direction of motion having been somewhat modified by the resisting mass of rock which lies to the east, and by the natural tendency of the sliding mass to take the shortest course to a lower level.

It is thus seen that the circumstances of the locality exactly fulfil the usual geological conditions for a landslip—*i.e.* a sloping bed of clay, which is liable to become slippery, and whose dip is towards the lower surface level where the overlying rocks find no support. Hence it may safely be said that any geologist, whose attention had been specially directed to the question, could have predicted that such an occurrence was extremely likely, sooner or later, to happen. There is, however, one necessary condition, which does not depend on the lie of the strata and the form of the ground, and that is that the clay should become slippery. This condition will probably account for the fact that in the area to the east of the Enbrook fault where all the other conditions are satisfied, *i.e.* in the neighbourhood of Radnor Cliff, no landslip has occurred. Clay is of course rendered slippery by the access of water. Now water will easily find its way through sandy strata, and there are sandy beds even in the lower portion till we come to the band of clay itself. As this is equally true in both localities the only difference can be in the amount of water.

Now there is a natural tendency for water to run down the dip slope of the strata, especially when there are hard bands as in the Folkestone beds, so that in this case most of the water will come from the west, and this source is cut off from the Radnor Cliff side by the Enbrook Valley, to the east of which there is little or no gathering ground; but to the west and north-west of the disturbed area there is a wide expanse of high ground, mostly rising 100 feet above the level of the Sandgate beds, and the water which falls on this finds its easiest outlet into these beds. They are therefore exactly in a position to get waterlogged, and that they are so is shown by the numerous springs that may be seen along the upper limit of the disturbed area.

The above considerations show that this area always has been and always will be liable to landslips. The lie of the beds which produces this liability cannot be altered by human agency, but the liability may be reduced to a minimum by a suitable system of drainage, which shall prevent the access of so large a body of water to so dangerous an area.

In the meantime the inhabitants of Sandgate may congratulate themselves that the shoreward dip of the beds and fault which breaks their continuity have reduced the result of the slip to a minimum, and rendered possible the remarkable circumstance that, though it happened in an area covered with houses, not a single house has been actually thrown down—not a single life lost.

As to the *immediate* cause of the occurrence, it is perhaps scarcely necessary to look for it. The landslip must necessarily have occurred at some time or another, and the conditions must for a long time have been gradually accumulating, by the constant access of water and the wearing action of the sea. If, however, the free discharge of the water from the beds has been in any way interfered with—by the stoppage of wells, or the construction of imperforate sea-walls—this would doubtless tend to the acceleration of the catastrophe; and an exceptionally wet season, like that we have recently experienced, might suffice to determine it. It would be scarcely necessary to add, except that the idea has been mentioned in the House, that the blowing up of the *Benvenue* and the *Calypso* could have absolutely nothing to do with it: in the first place, because the scene of the explosions was to the west of the disturbed area, and cut off from it by the massive Hythe beds, which are absolutely undisturbed—to say nothing of the Atherfield clay at sea which must necessarily intervene; secondly, because such a cause could not require several months to operate; and, lastly, because a vibration would rather tend to cause such beds to settle than to slip.

J. F. BLAKE.

NOTES.

PROF. VIRCHOW will deliver the Croonian Lecture this afternoon, and in the evening he will be entertained at the public dinner which is to be given in his honour at the Hôtel Métropole. It may at the same time be noted that an important scientific work, in three volumes, has just been issued by the Berlin publisher, August Hirschwald, in memory of the celebration of Prof. Virchow's seventieth birthday. The work is entitled "Internationale Beiträge zur Wissenschaftlichen Medicin," and among the contributors to it are Sir James Paget, Sir Joseph Lister, and other English writers.

A MOVEMENT has been started for the celebration of the hundredth anniversary of the birth of the illustrious Russian mathematician, Lobatcheffsky, who was described by the late Prof. Clifford as "the Copernicus of geometry." He was born on October 10, 1793. It is proposed that honour shall be done to his memory at the Imperial University of Kasan, with which he was for many years connected as a professor and as rector. The Physico-Mathematical Society of the University, which has taken the matter in hand, hopes to be able either to establish a prize with Lobatcheffsky's name for researches in mathematics, or to erect a bust of the great investigator in the University buildings. If the funds suffice, both of these things will be done. Subscriptions should be sent to the Physico-Mathematical Society, Kasan.

THE German Congress of Naturalists and Physicians, which was postponed last year on account of the outbreak of cholera, is to meet this year at Nürnberg.

PROF. W. C. ROBERTS-AUSTEN, F.R.S., chemist and assayer to the Royal Mint, and Mr. Thomas Bryant, President of the Royal College of Surgeons, have been elected members of the Athenæum Club, under the provisions of the rule by which the Committee is empowered to elect annually nine persons "of distinguished eminence in science, literature, the arts, or for public services."

THE half-yearly general meeting of the Scottish Meteorological Society was held at Edinburgh on Monday, March 13. The council of the society submitted its report, and the following papers were read:—On the temperatures of Lochs Lochy and Ness as affected by the wind, by Dr. Murray; mean temperature of London from 1763 to 1892, by Dr. Buchan; hygrometric researches at the Ben Nevis Observatories, by A. J. Herbertson.

WE understand that an enormous iron meteorite weighing nearly one ton (2044 lbs.) has just been received by Mr. J. R.

Gregory, of Charlotte Street, Fitzroy Square, from the same locality as the one described by him in NATURE in November last; it is 4 feet 2 inches long by 2 feet 3 inches wide and 20 inches thick. It comes from Youndegin in Western Australia.

THE secretary of the Physical Society asks us to say that in the report of the Society's annual general meeting (NATURE, March 2, p. 429) the name of Mr. J. T. Hurst was wrongly included in the list of members lost by death.

ATTENTION is called in the North Atlantic Pilot Chart to the fact that the great astronomical event of the month of April—the eclipse of the sun on April 16—will have certain features of special interest to the science of marine meteorology. Masters of vessels and observers who may be within the limits of the visibility of this eclipse are earnestly requested to make reports of their observations. The chart shows graphically the path of the total eclipse, the northern limit of visibility, and curves showing at what places the eclipse begins at 1 hour, 2 hours, and 3 hours, and when it ends at 3 hours, 4 hours, and 5 hours, Greenwich mean time, April 16. It is pointed out that there are observations which any one can make, and that these may prove to be of great interest and value. The following are particularly desired: (1) any changes in the clouds accompanying changes of temperature during the eclipse; (2) reading of the barometer every half hour from 11.30 to 5.30 G.M.T., while in the path of total eclipse; (3) temperature of the air, both wet and dry bulb, during the same interval; (4) any peculiar appearance of light during the eclipse; (5) the altitude and azimuth of any faint comet that may be detected during the eclipse.

THE weather during the latter part of last week was exceptionally fine over England, the daily maxima being frequently above 60°, and reaching 66° in the midland counties on Sunday, a temperature which is nearly 20° above the mean maximum for the time of year. The nights, however, were very cold, owing to the radiation under a clear sky; in some localities the readings on the grass were as low as 23° to 25°, and little, if any, above freezing in the shade. These conditions were occasioned by the distribution of atmospheric pressure, there being a well-defined anticyclone over the southern parts of England and over part of the continent. But in Scotland and Ireland the weather was much less settled; low-pressure areas lay off the north of Scotland, causing gales and occasional rainfall, while hail occurred at Wick on Friday. At the beginning of the present week the barometer fell decidedly, the anticyclone moved to the eastward, and the type of weather underwent a complete change, fog becoming prevalent at many places in the southern parts of the kingdom, and on Tuesday a new depression reached the north of Scotland, accompanied by rainy and unsettled weather generally. The official report for the week ending the 11th instant showed that bright sunshine was more prevalent than it has been for many weeks, and that it exceeded the average amount in all districts; also that there was a great deficiency in the amount of rainfall in all districts, except in the north of Scotland.

Das Wetter for February contains some particulars respecting the extraordinarily high barometer readings during January. At the commencement of that month the isobar between Lapland and Finland indicated the unusual height of 30·9 inches, which increased to 31·1 on the 3rd. On this day the centre of high pressure was in the vicinity of the White Sea, the reading at Archangel being 31·2 inches, and at Kargopol, on the Onega, 31·3 inches. Such high readings in those parts in winter are the more noteworthy, owing to the frequent passage of depressions over the north of Europe during that season. Subsequently the high pressure area shifted to Eastern Siberia, where high readings are more usual. On January 12 the pressure at Irkutsk exceeded 31·5 inches, and on the next day it reached 31·7. According to Dr. Hann, such a high reading had only been recorded once before, viz. on December 16, 1877, at Semipalatinsk. But on the morning of January 14, the reading at Irkutsk, reduced to sea level and corrected for gravity, attained the unprecedented height of 31·8 inches. So far as it is known this is the highest reading that has ever been recorded on the globe. These high pressures were also accompanied by very low temperatures. On January 14 the thermometer at Irkutsk fell to minus 51°·3, or about 40° below the mean for the time of year. In the north of Sweden the thermometer fell to minus 76°, or 38° below the freezing point of mercury.

SOME shocks of earthquake have lately been felt at Quetta. Two occurred on February 13 at 9.50 p.m., and another shock on the 14th at about 3 a.m. These shocks caused a considerable scare, and many people rushed out of doors, the condition of many houses in Quetta being anything but safe. The *Pioneer Mail* says that several houses have since fallen at Quetta, and a number of people have been injured, and two killed thereby.

DR. D. D. CUNNINGHAM is carrying on a series of microscopical investigations into the Indian potato blight. Elaborate experiments are also being made in the practical treatment of the crop and of diseased soils. The results, according to the *Pioneer Mail*, are expected to be important, and will be made public in due course.

IT appears from the Ceylon Census Report for 1891 that the bulk of the population of the island live by agriculture. The proportion of the agricultural class to the general population is in Ceylon 70·5; in India 64·09; in England and Wales 15·44. Next in order of number comes the industrial class, which includes something less than one-sixth, and after it the commercial class, holding one-twentieth. The *Ceylon Observer* notes as remarkable the fact that in the Southern Province there is a larger Sinhalese industrial population than in any other province—a result, it is supposed, attributable to the large number of people engaged in utilising the products of the cocoa-nut tree, with a certain number of workers in jewellery, tortoise-shell, &c.

TWO Akka girls, who were rescued from Arab capturers by Dr. Stuhlmann and his companions, have been brought to Europe, and will remain in Germany for some months. In the summer they will be taken back to Africa, where they will be placed in some mission house, or otherwise provided for. They are supposed to be between seventeen and twenty years of age. A correspondent of the *Daily News*, who saw them at Naples, says they are well proportioned, and as tall as a boy of eight years of age. Their behaviour is "infantile, wild, and shy, but without timidity." One of them was always cross, bending her head, and glaring from beneath frowning brows; while the other often laughed joyously, was pleased with bead bracelets and other trinkets given to her, and expressed by a queer sniff of her flat nose her appreciation of some chocolate bonbons. After making "a capital dinner on rice and meat," they greatly enjoyed the sunshine in a pretty garden, where they gradually grew more confident, and finally allowed themselves to be photographed arm-in-arm with the little son of their hostess. "The coquettish one shook with laughter, and seemed to guess that a process was going on flattering to her vanity, while the cross one still looked gloomy and suspicious. They showed neither wonder nor admiration of the people and things around them in the artistically furnished house and tasteful garden; their eyes, though large and lustrous, have less expression than the ugly eyes of a monkey." These interesting representatives of one of the pygmy races of the world are to be presented to various scientific societies in Berlin.

An interesting address delivered by M. Paul Richer at the last meeting of the French Association for the Advancement of Science is printed in the current number of the *Revue Scientifique*. The subject is the relation of anatomy to art. M. Richer gives a lucid account of the canons of the human figure which have been adopted during various periods in the history of art, referring especially to those of the Greek sculptors Polycleitos and Lysippos and to those of Leonardo da Vinci, Albert Dürer, and Jean Cousin. He then shows that we now have materials for the establishment of a scientific type of the proportions of the human body, so far at least as the white race is concerned. This type is not, of course, to be reproduced in the works of artists; but M. Richer thinks it may be of real service to them as a guide in the appreciation of the proportions of the different models they have from time to time to study.

Mr. A. C. Macdonald contributes to the *Agricultural Journal* of Cape Colony a full and interesting account of what has been done to develop the dairy industry in Great Britain. Speaking of the same industry in Cape Colony, he says that it is there only in its infancy. This is largely due to the difficulty which farmers otherwise favourably circumstanced have had hitherto to contend with in the transport of their dairy products to market in good condition. Now, however, the extension and union of railways have more or less removed this difficulty, and many of the leading farmers, taking advantage of the facilities afforded by such extension and union, have greatly increased their butter production. In fact, within the last two years the increase in the manufacture of this commodity in the colony has been very large. Mr. Macdonald sees no reason why in districts such as Alexandria, Bathurst, Peddie, Victoria East, Fort Beaufort, Albany, Port Elizabeth, Uitenhage, and East London, where it has now become difficult to farm with small stock or grow grain profitably, dairying should not prove as great a success as it has done in the Australian colonies, which in some respects are not so favourably situated as Cape Colony, provided that the same means are used.

The nucleus of a palæontological collection was formed at the Johns Hopkins University five years ago by Dr. W. B. Clark from the deposits of the Atlantic coastal plain. He was able to gather together a very large amount of material owing to the richness of the formations in fossils and their accessibility to the city of Baltimore; and since that time additions have been made each year by collection and by exchange with the National and State Surveys and educational institutions. We learn from the new number of the University's "Circulars" that there was a greater increase of the fossil collections during the past year than during any preceding one. This was accomplished mainly by exchange and purchase, although a considerable amount of material was collected in the field. Among the more notable additions was a collection sent in exchange by Mr. G. F. Harris, of the British Museum. This collection is very rich in tertiary fossils, illustrating many of the typical English localities. It contains hundreds of species from the Eocene, Oligocene, and Pliocene of England. Owing to the fact that the richest and finest collections of the Palæontological Museum of the University are from the American tertiary, these English tertiary fossils are said to be of the highest interest and usefulness to students of geology.

An interesting paper on Artesian wells as a water supply for Philadelphia was lately read by Prof. O. C. S. Carter before the chemical section of the Franklin Institute. A long-continued drought caused much inconvenience at Philadelphia during the summer of 1892, so that the inhabitants would be likely to welcome any practicable suggestion for providing them with new supplies of fresh and wholesome water. Prof. Carter, after careful investigation, strongly recommends the use of artesian wells, the water of which, he says, would be of considerable quantity and excellent quality.

An instrument for measuring densities of liquids, which for simplicity can hardly be surpassed, is described by A. Handl in the *Wiener Berichte*. It consists of two glass tubes joined by an indiarubber tube. One of them is 30 cm. long and about 1 cm. wide, and bears two marks scratched into the glass at a distance of 20 cm. This tube is immersed in the liquid to be examined up to the lower mark. Meanwhile the other tube is totally immersed in water. On pulling it out the liquids in both tubes rise until that in the first tube reaches the second mark. The height of the water-column, read off on a suitable scale, measures the density of the liquid.

Messrs. Simpkin, Marshall and Co have issued Miss Eleanor A. Ormerod's "Report of Observations of Injurious Insects and Common Farm Pests, during the Year 1892, with Methods of Prevention and Remedy." This is Miss Ormerod's sixteenth report. She notes that during 1892 most of the insect infestations commonly injurious to field crops and fruit were present to such an extent as to cause inquiry as to their nature and as to methods of prevention, but that for the most part they did not affect large districts to a serious extent.

A new scientific journal devoted to the interests of general systematic botany has made its appearance, published at Chambésy, near Geneva, under the title *Bulletin de l'Herbier Boissier.*

A Botanical Dictionary, by Mr. A. A. Crozier, has just been published by Holt and Co., of New York, containing definitions of over 5000 words.

Messrs. Perken, Son, and Rayment have issued an illustrated catalogue of photographic apparatus, magic lanterns, and optical instruments.

Messrs. Whittaker and Co. will issue in their Specialists' Series a work on "The Dynamo," by C. C. Hawkins and F. Wallis, and a new edition of Sir David Salomons' work on "The Management of Accumulators." They have also in preparation in the Library of Popular Science an introductory work on "Electricity and Magnetism," by S. Bottone, and one on "Geology," by A. J. Jukes-Browne. Mr. Perren Maycock has completed the second part of his work on "Electric Lighting and Power Distribution," and it will be issued in a few days. An illustrated work on "British Locomotives," by C. J. Bowen Cooke, of the London and North-Western Railway, is in the press, and will probably be issued in May. Messrs. Whittaker have also in the press a new work by J. Horner ("A Foreman Pattern-Maker"), entitled "The Principles of Fitting," and the second part of Mr. Brodie's "Dissections Illustrated."

Messrs. Griffin and Co. announce "A Manual of Dyeing," by Dr. Knecht, Mr. Chr. Rawson, and Dr. R. Loewenthal; "Oils, Fats, Waxes, and Allied Materials, and the Manufacture therefrom of Candles, Soaps and other Products," by Dr. C. R. Alder Wright; "Painters' Colours, Oils, and Varnishes, by Mr. Geo. H. Hurst; "Griffin's Electrical Price-Book," edited by Mr. H. J. Dowsing; the tenth annual issue of the "Year-Book of Learned and Scientific Societies;" "A Treatise on Ruptures," by Mr. J. F. C. Macready; "Forensic Medicine and Toxicology," by Prof. Dixon Mann; "The Medical Diseases of Children," by Mr. Bryan Donkin; "A Medical Handbook for the Use of Students," by Mr. R. S. Aitchison; "The Physiologist's Note-Book," by Dr. W. Hill; and "A Text-Book of Biology," by Prof. J. R. Ainsworth Davis.

Messrs. L. Reeve and Co. have in preparation a new work on the British Aculeate Hymenoptera from the pen of Mr.

Edward Saunders, uniform with the same author's work on the Hemiptera Heteroptera, just completed.

The extreme difficulty which is experienced in the separate identification of the typhoid bacillus and the *B. coli communis* in consequence not only of their great resemblance microscopically, but also in the appearances to which they give rise when grown in artificial culture media, has caused much doubt to be cast upon the alleged detection of the former in water. It is well known that the *B. coli communis* is an almost constant attendant upon the typhoid bacillus, being normally present in the alimentary canal, and being, moreover, frequently found in large numbers in polluted streams and contaminated well-water. In nearly all cases, therefore, where a water is suspected of harbouring the typhoid bacillus the *B. coli communis* may also be expected to be present. Unfortunately, the many methods which have been devised, some of which are extremely ingenious, for separating out the typhoid bacillus from other organisms, are based upon the idea that few, if any, micro-organisms can flourish in as acid a medium as this bacillus, and no account has been taken of the refractory nature in this respect of the *B. coli communis.* This organism is, in fact, possessed of far greater powers of resistance than its more dangerous companion, and whilst the proportion of citric acid or phenol to be added, whether directly to the water or to the culture medium, is such that in some cases the other organisms present are destroyed whilst the typhoid bacillus and the *B. coli communis* are left untouched; in other methods the amount of acid prescribed is sufficient to entirely obliterate the typhoid bacillus, leaving, however, the *B. coli communis* sole master of the field. In an extremely interesting paper which has appeared in the *Zeitschrift für Hygiene,* vol. xii. p. 491, 1892 ("Ueber den Typhusbacillus und den *Bacillus coli communis*"), Dunbar discusses very fully all these points, and gives an account of the principal methods in vogue for the isolation of the typhoid bacillus, together with a critical commentary based upon his own experimental observations, as well as those of other investigators. As a result of these researches Dunbar maintains that no absolutely trustworthy method at present exists for the successful identification of the typhoid bacillus in the presence of the *B. coli communis,* and that it is highly probable that the latter has in many cases been mistaken for the former in water supposed to contain the typhoid bacillus. There can be no doubt, however, that, with a knowledge of these imperfections, the judicious application of some of these methods may very greatly facilitate the isolation of the typhoid bacillus in the presence of other organisms, and that, moreover, a method which is able to restrict the varieties present on any given gelatine plate to the *B. coli communis* and the typhoid bacillus already removes some of the chief obstacles.

A further communication from M. Moissan concerning the chemical properties of the diamond is contributed to the current number of the *Comptes Rendus.* In the first place precise determinations have been carried out of the temperatures at which various kinds of diamonds undergo combustion in pure oxygen. As the action of oxygen upon the diamond has so long been known, it appears somewhat singular that, as M. Moissan states, no exact data concerning the temperature of combustion should hitherto have been obtained. It will doubtless be remembered that Dumas and Stas, in their celebrated experiments in connection with their determination of the atomic weight of carbon, burnt diamonds in a current of oxygen in a porcelain tube heated in an ordinary earthenware table furnace. Other chemists have since performed similar experiments with the aid of the combustion furnaces employed in organic analysis. In order to be able to determine the temperature of such combustion with precision, M. Moissan has employed a modification of Le Chatelier's thermo-electric apparatus, placed along with the diamond in a wide porcelain tube closed at the ends with glass plates through which the combustion in oxygen could be viewed. It was found that when the temperature is slowly raised under these conditions the combustion proceeds gradually without the production of light. But if the temperature is raised 40° or 50° above the point at which this slow combustion commences, a sudden incandescence occurs, and the diamond becomes surrounded by a brilliant flame. Various deeply-coloured specimens of diamonds burnt with production of incandescence and flame at temperatures of 690°–720°, but transparent Brazilian diamonds did not attain the stage of slow combustion without incandescence till the temperature of 760°-770° was reached. A Cape diamond suffered gradual combustion at 780°–790°. Specimens of exceedingly hard boort likewise commenced to combine with oxygen at 790°, and burnt brilliantly at 840°–875°. When Cape diamonds were heated in a current of hydrogen to a temperature of 1200° they remained unchanged; but if the stones had previously been cut they frequently lost their brilliance and transparency. Dry chlorine gas was found incapable of reacting with the diamond until a temperature of 1100°–1200° was attained. Hydrofluoric acid vapour likewise only reacted at about the same high temperature. Vapour of sulphur also requires to be heated to 1000° before reacting, but in the case of black diamonds bisulphide of carbon is produced at about 900°. Metallic iron, at its melting point, combines with the diamond in a most energetic manner, and it is a point of considerable interest that crystals of graphite are deposited as the fused mass cools; hence the experiment forms a striking mode of converting the allotropic form of carbon which crystallises in the cubic system into that which crystallises in the hexagonal system. Melted platinum likewise combines with the diamond with great energy. A most curious reaction has been observed to occur between the diamond and the carbonates of potassium and sodium. When a diamond is placed in the fused carbonate contained in a platinum dish it rapidly disappears, and carbonic oxide is copiously evolved. Fused nitre or potassium chlorate, however, have not been observed to exert any action upon diamonds.

Notes from the Marine Biological Station, Plymouth:—Recent captures include examples of the Hydroid *Myriothela phrygia,* the Opisthobranchs *Aplysia punctata* and *Oscanius membranaceus,* and the "cotton-spinner" (*Holothuria nigra*). The week has been marked by a rapid increase in the numbers of Echinoderm larvæ, especially of *Auricularia* and *Bipinnaria,* but *Plutei* are still relatively scarce. Ephyræ of *Aurelia* continue plentiful, and have grown appreciably. Among the Anthomedusæ, *Rathkea octopunctata, Sarsia prolifera* (without buds), and the gonozooid of *Podocoryne carnea* have been noticed; among Leptomedusæ, the *Eucopium-* and *Eucope-*stages of *Clytia Johnstoni* have made their appearance, together with *Thaumantias Forbesii* (Haeckel) and small *Obelia* medusæ. Several *Muggiæa* and a single *Pilidium* were seen on the 11th inst. The Nemertine *Amphiporus lactifloreus,* and the Anomoura *Eupagurus Prideauxii, Galathea dispersa* and *intermedia* have begun to breed.

The additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus,* ♂) from India, presented by Mr. G. J. Sheppard; a Leopard (*Felis pardus*) from Kismaya, East Africa, presented by Mr. J. Ross Todd; a Spotted Ichneumon (*Herpestes nepalensis*) from Nepal, presented by Lieut. Philip Egerton, R.N.; six Vulturine Guinea Fowls (*Numida vulturina*) from East Africa, presented by Mr. R. J. Macallister; a Black Tanager (*Tachyphonus melaleucus*) from South America, presented by Miss Trelawny; a Greater Sulphur-crested Cockatoo (*Cacatua* *galerita*) from Australia, presented by Miss Amy M. Dundas; three white-tailed Gnus (*Connochætes gnu*, ♂ ♀ ♀) from South Africa, deposited; a Burchell's Zebra (*Equus burchelli*, ♀), two Silver-backed Foxes (*Canis chama*), a Cape Bucephalus (*Bucephalus capensis*) from South Africa, a Salvin's Amazon (*Chrysotis salvini*) from South America, purchased; four Upland Geese (*Bernicla magellanica*) from the Falkland Islands, received in exchange; four Coypus (*Myopotamus coypus*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET HOLMES (1892 III.).—This comet has now become rather a difficult object, but the following ephemeris may be useful for those employing large instruments:—

12*h*. *Paris Mean Time.*

1893.	R.A. (app.) h.	m.	s	Decl. (app.) °	′	″
March 16	2	55	29·0	+ 35	27	53
17		57	16·1		30	43
18	2	59	3·5		33	33
19	3	0	51·1		36	23
20		2	38·9		39	13
21		4	27·0		42	2
22		6	15·3		44	51
23	3	8	3·8	35	47	40

THE SIZES OF JUPITER'S SATELLITES.—M. J. J. Landerer describes in the *Comptes Rendus* some experiments made to test the accuracy attainable in measuring the diameters of satellites by their shadows cast on the primary. He took a finely-ground glass plate and blackened it, leaving a space in the middle representing the appearance of Jupiter with its bands and small black spots representing shadows. He then placed it at a distance of 314 m., illuminated it by a suitable light from behind, and sketched the disc through the telescope used for the actual observations. With some practice it was found possible to draw such spots correctly to within one-tenth per cent. M. Landerer then applied his method to the satellites themselves, and found the following numbers for their radii:—0·0199, 0·0184, 0·0435, and 0·0419. The number of observations was twenty-six for the first satellite, seventeen for the second, thirty for the third, and twenty-two for the fourth. The commonly accepted numbers, obtained by micrometric measurements of the bright satellites, are 0·0291, 0·0259, 0·0431, and 0·0367.

OBSERVATIONS OF THE ZODIACAL LIGHT.—In No. 3155 of the *Astronomischen Nachrichten* Mr. Arthur Searle gives an account of the experimental work he and Prof. Bailey have been carrying on with respect to the best methods of making and recording observations of the zodiacal light. Owing to the prevalent use of electric light in the neighbourhood of Harvard College Observatory, the observations were made at some distance away. The general mode of defining the position of the zodiacal light up to the present has been by drawing its outline on a star atlas exactly as it appeared in the sky at the time of observation. The great drawback about this method is that in the majority of cases the zodiacal light has no definite outline, but gradually decreases in brightness as one recedes from the axis of the figure, eventually fading imperceptibly away. That this is so is the general idea and is backed up by observations, but it is also true that the contour, so to speak, of the luminous figure is sometimes sharper at some places than at others. Instead of outline drawings these observers have substituted contour lines in which the degree of light represented by each contour is stated; the latter is accomplished by selecting a portion of the sky "unaffected by the zodiacal light, but of equal brightness with those portions traversed by the contour line." This region would naturally lie near the Milky Way and its situation is defined by the stars in the vicinity. To complete the record the geographical position of the observer's station and the time of observation should be included in the statement. In addition to the contour lines two other suggestions are put forward, (1) that the axis of brightness should be indicated by a line, and (2) that should there be distinctly observed by any chance two cones of light, an outer and an inner, such a distinction should be shown in the record by drawing a boundary between them.

WEINEK'S LUNAR ENLARGEMENTS.—Since the appearance of the magnificent enlargements obtained by Dr. Weinek from the Lick Observatory negatives, many details of surface structure have been brought to light which have up till now evaded even the aided eye. These details, consisting as they do of winding rills, valleys, and hair-like markings, appear quite sharp and distinct in contrast with the larger surface features, and it is this fact that has caused some uncertainty about their being actual features on the lunar surface. Every one acquainted a little with photography knows that a photograph loses in sharpness the more it is enlarged, and it is here very curious to find a picture after being twenty times enlarged with minute details quite crisp and sharp, and the larger portions quite fluffy, as is the case in the enlargement of Vendelinus, taken on August 31, 1890. As Mr. Elger remarks (*Observatory*, March), "if these curious markings represent actual features on the moon's surface, ought they not to be easily seen in any good telescope that shows the formation and its principal details with far greater sharpness than the twenty-times enlarged negative, and many small craters, &c., in addition which are scarcely traceable upon it? One does not understand why this should not be so, unless these objects make an impression on the sensitive plate that they fail to do on the retina, which is hardly likely to be the case." M. Faye, in *Comptes Rendus* (No. 9) for March, when referring to these enlargements, says that several members, MM. Fizeau, Mascart, and Cornu included, reserved their opinions on the interpretation of these markings, which seemed to be the results of retouching. "Certain vermiculées appearances," says he, "show a clearness which is strictly in contradiction with the very general 'estompée' appearance of the lunar cliché."

"L'ASTRONOMIE" FOR MARCH—The March number of this magazine commences with some observations of Jupiter made at the observatories in Juvisy, Bruxelles, and in Spain during the past year. The numerous drawings which accompany the observations impress one with the incessant change that is taking place in the dense atmosphere, while the large red spot was as usual seen ploughing its way apparently through one of the dark belts. The period of rotation of this spot seems to have suffered a retardation during the last twelve months, as will be seen from the following table, which we take the liberty of producing here:—

	h.	m.	s.		h.	m.	s.
1879	9	55	35·7	1886	9	55	40·1
80			35·0	87			40·1
81			36·1	88			40·2
82			37·2	89			40·3
83			38·1	90			41·5
84			39·2	91			42·2
85			40·1	92			39·3

M. Guillaume, of the Lyons Observatory, contributes some interesting notes on the appearances of Saturn's rings during the same year, at which time it will be remembered we were lying nearly in its plane. Besides the drawings showing the general features of the planet, there are some illustrating the different degrees of luminosity observed at various parts of the ring itself. "The Circulation of Winds at the Surface of the Globe" is the title of an article by M. A. Duponchel, in which he gives as an introduction a brief historical account of the early hypotheses; while M. Flammarion gives us the fifth chapter on "Comment Arrivera la fin du Monde," dwelling for the most part on the destructive forces at work on the earth's surface.

BERMERSIDE OBSERVATORY.—In the advertising sheets of the *Observatory* for March we are sorry to see the following notice:—"On sale (the owner giving up astronomical work) the 3-foot Common reflector, with or without dome, complete, in perfect order. Mirror by Sir H. Grubb. Full particulars on application to J. Gledhill, Bermerside Observatory, Halifax."

GEOGRAPHICAL NOTES.

A TELEGRAM from Port Stanley announces the return of the Dundee whaling ships to the Falkland Islands (see NATURE, p. 282) on their way home. In the two months during which they were absent it is improbable that high latitudes were reached, but it is evident that a cargo was rapidly obtained, although it is not reported whether the species of whale hoped for was found.

THE Geographical Studentship at Oxford lately held by Mr. Grundy has been awarded to Mr. W. H. Cozens-Hardy, New